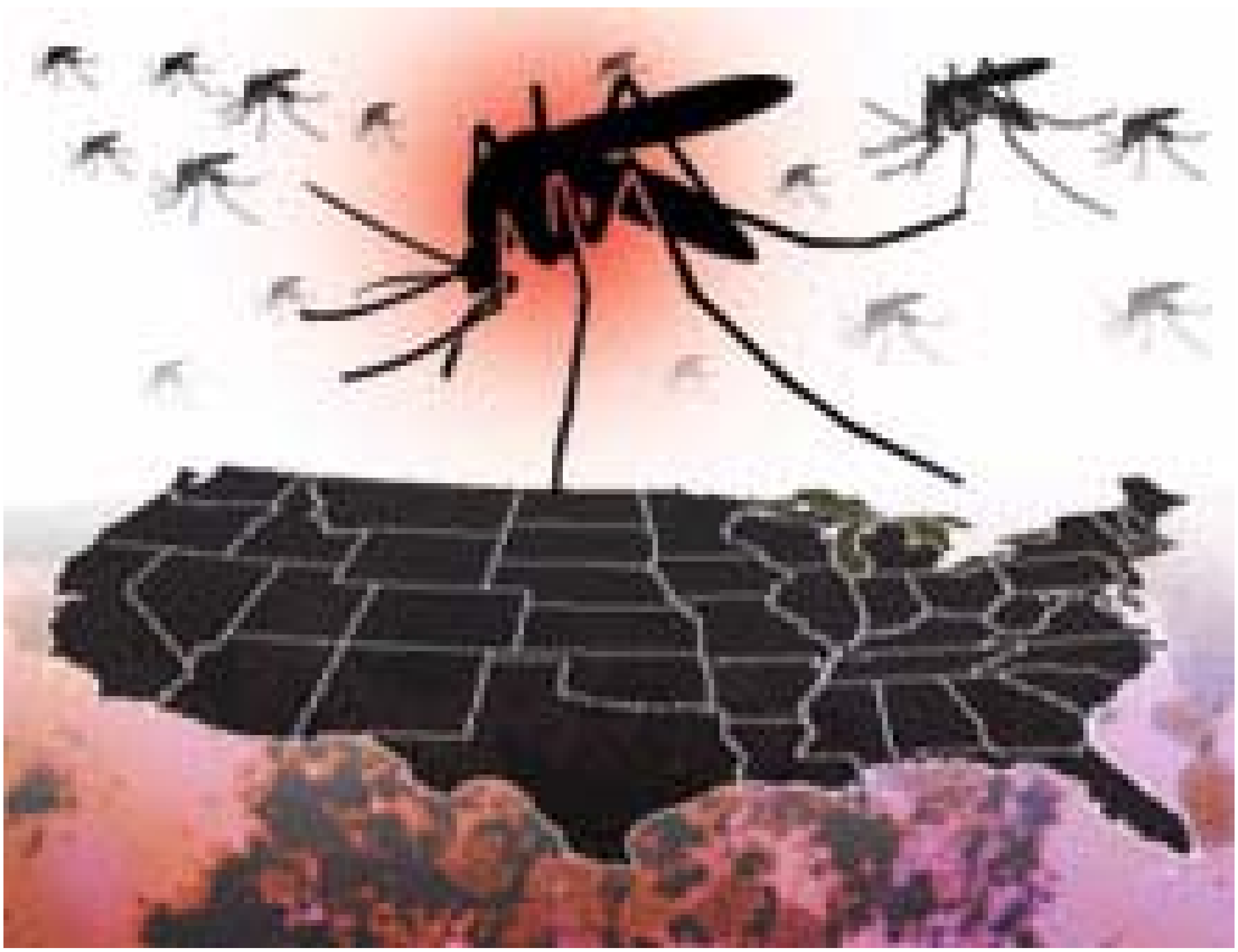
West Nile virus Surveillance
2004 Summary



Prepared by the U.S. Army Center for Health Promotion
and Preventive Medicine-West,
Fort Lewis, Washington

MCHB-AW-ES (40-5f) 11 March 2005

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: 2004 West Nile virus Year End Report and Summary

1. REFERENCES.

a. Memorandum, Department of the Army, Office of the Surgeon General, DASG-PPM-SA, 28 June 2004, Subject: CONUS Regional Medical Centers West Nile Virus Surveillance and Prevention Plans.

b. USACHPPM West Nile Virus Surveillance Guide.

c. TB MED 561, 1 June 1992, Occupational and Environmental Health Pest Management.

d. Centers for Disease Control and Prevention (CDC), Epidemic/Epizootic West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control, 2003.

e. Memorandum, MCHB-AW-ES, Subject: West Nile Virus Year End Report and Summary, 23 February 2004.

2. AUTHORITY. The Surgeon General directed the Regional Medical Commands to establish West Nile virus (WNv) Surveillance Plans. As part of this program the Entomological Sciences Division (ESD), U.S. Army Center for Health Promotion and Preventive Medicine-West (USACHPPM-W) coordinated the vector (mosquito) surveillance portion with Preventive Medicine personnel, or their equivalent, in support of each installation's overall WNv surveillance program (References 1a-d).

3. PURPOSE.

a. To summarize the test results for mosquitoes submitted as part of the 2004 DoD WNv mosquito surveillance program on military installations located within the USACHPPM-West area of responsibility.

b. To provide information to assist installation Preventive Medicine and pest management personnel in developing an effective mosquito surveillance program. In addition, information gathered from mosquito surveillance and WNv testing provides guidance to assist personnel in developing effective mosquito control programs and prevention strategies for reducing the impact of WNv.

4. BACKGROUND.

a. West Nile virus was first recognized in North America in the summer of 1999 in New York City and was associated with avian, equine and human deaths. In 2000, WNv was detected in mosquitoes, birds, horses or humans along the East Coast from New Hampshire to North Carolina. WNv moved westward from the initial focal point in New York and the East Coast. In 2001 it was first detected in birds in Ohio and along the Ohio River in southern Indiana. In late 2001, WNv was also detected in the bird population in the Chicago and St Louis areas.

b. West Nile virus started to impact humans in the Midwestern and Great Plains states in 2002. By early 2002, most states had an active WNv surveillance program to detect this virus in birds and horses. Many states followed suit by testing mosquito pools for the presence of WNv. As the 2002 mosquito season progressed, it became apparent that the virus was expanding up along the Mississippi River from Louisiana in the south, and northward into Iowa and Minnesota from Southern Illinois. By this time, most of the counties north of the Ohio River in Ohio, Indiana, and Illinois reported WNv activity. In the summer of 2002, sporadic WNv activity began showing up in mosquitoes along the Missouri, Arkansas, and Platte Rivers as the virus moved further west (See Figure 1 for the counties with mosquitoes positive for WNv in 2002).

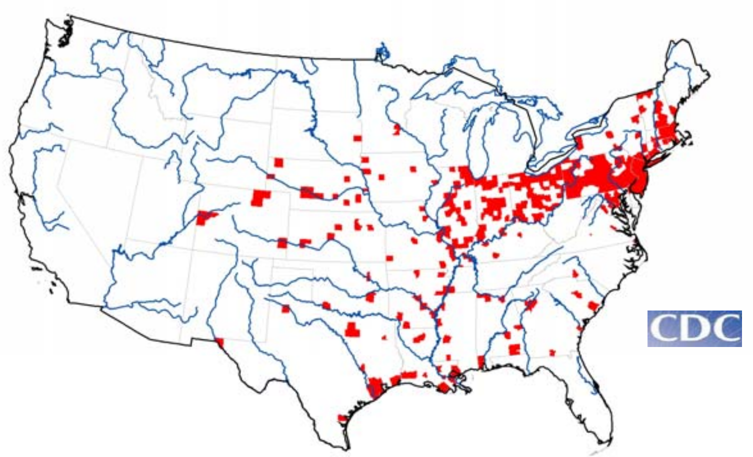


Figure 1. US Counties reporting WNV-positive mosquitoes, 2002

c. As WNv expanded west out of the Mississippi Valley, the dynamics of the mosquito populations changed. West Nile virus began circulating in certain mosquitoes that bite birds, horses and humans equally. *Culex tarsalis*, the Western encephalitis mosquito (Figure 2), is found throughout the United States west of the Mississippi River. It is also the major vector of St. Louis and Western Equine Encephalitis in this area.

Figure 2. *Culex tarsalis*. This mosquito develops rapidly and produces multiple generations. In the hot summer season, egg to adult development occurs in as few as four to ten days. A female can lay six or seven times, with some 300 eggs in a batch. Without control efforts, local populations can reach huge numbers in a short time. *Culex tarsalis* breeds in nearly every freshwater source except tree holes. Larvae are found in all but the most polluted ground pools. Summer agricultural irrigation produces an especially favorable environment, with highest population densities coinciding with the months of most intense irrigation.

Once WNv began to circulate in this population of mosquito species, the number of horse cases in the area began to increase rapidly. By the end of the 2002 mosquito season, most of the counties between the Mississippi River and the Rocky Mountains had at least one case of WNv in horses. See Figure 3 for the counties testing positive for equines. It only appeared to take one mosquito season for this entire region of the country to witness the impact of WNv.

d. In 2002, the spread of WNv did not stop at the Rocky Mountains. Horse cases were detected in New Mexico along the Rio Grande River and along the Colorado River in western Colorado. Most of Montana and Wyoming also had their share of WNv positive horses. Typically by October most of the mosquito activity would have slowed down in most parts of the country. In Washington State there were dead bird positives in two counties: one county in the extreme northeast corner of the state, and one county adjacent to the Puget Sound. Horse cases were also detected November of 2002. Essentially, WNv had reached the West Coast in three years.

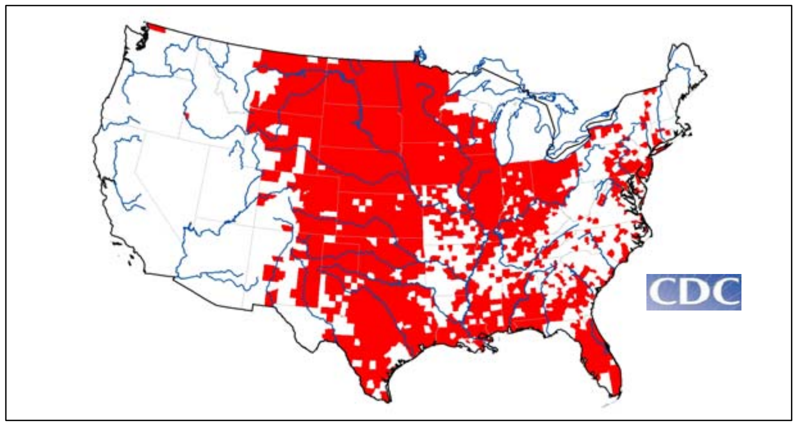


Figure 3. US Counties reporting WNv-positive equine cases, 2002

e. No human cases of WNv were confirmed as of 2 July 2003 by the CDC. However, there were numerous accounts of WNv reported in mosquitoes, birds and horses. The onset of WNv activity seemed to be running at least a month earlier than what was previously reported in 2002. Figure 4 shows the early 2003 surveillance data for WNv positive birds reported by the US Geological Survey. These data were not the only activity in avian populations, but by early summer WNv was detected along the Platte and Arkansas Rivers in Colorado. This was an early indication of what was to be the largest outbreak of WNv in North America.

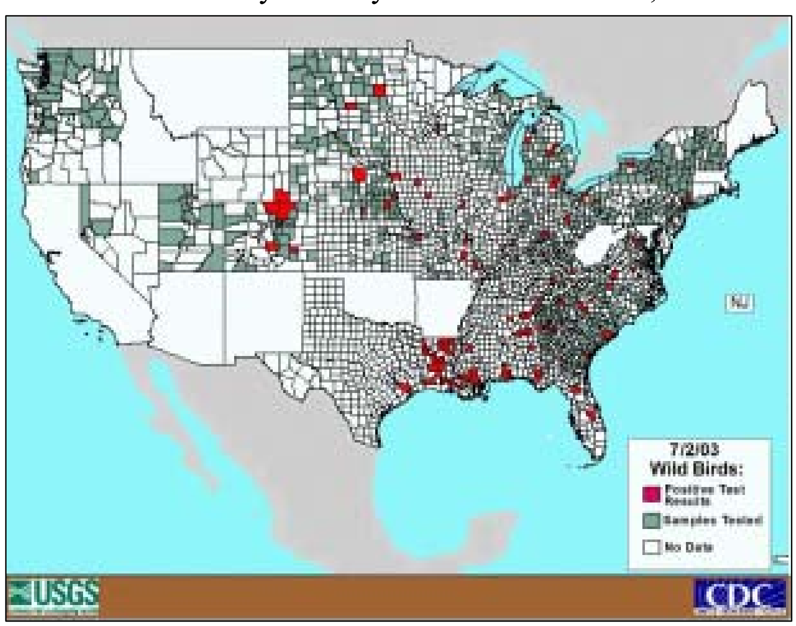


Figure 4. US Counties reporting WNv-positive birds, 7/2/03

f. In 2003, over 71 percent of the human WNv cases were reported from five states: Colorado, Nebraska, North and South Dakota, and Wyoming. Texas also had a significant number of human cases and was second to Colorado in the number of human deaths resulting from WNv infection. For the final 2003 human case numbers reported by the CDC see Figure 5.

g. In early October 2003, as WNv activity was subsiding in many parts of the country, the CDC predicted that areas of Southern California would be the most likely epicenter of this disease during 2004. The main reason for this assumption was because WNv was detected for the first time in mosquito and bird populations in areas of Southern California in 2003 (see Figure 6). The 2004 season would essentially be the second year (typically the year of highest activity) for WNv in the State. This turned out to be the case as California had almost twice the number of human cases (828) than any other State. Over 85% of these cases were reported from four counties in Southern California.

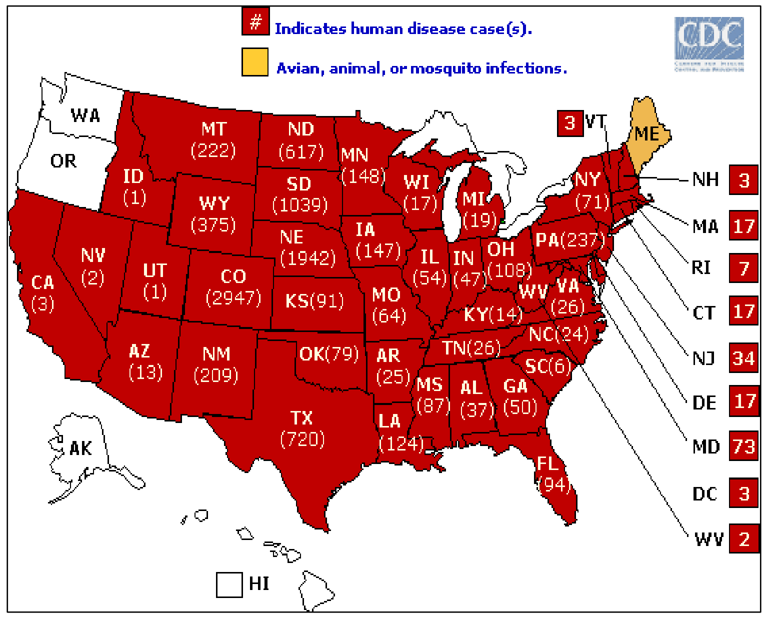


Figure 5. Human West Nile Virus activity, 2003

h. The Arizona Department of Health Services reported about half as many human cases of WNv (391) as California in 2004. However, Maricopa County which is comprised mostly of desert areas in the West and the Phoenix metropolitan area in the East reported more human cases of WNv (357) than any other county in the United States. The Phoenix area was the most active area of the country and positive pools of *Cx. tarsalis* or *Culex quinquefasiatus*, the southern house mosquito, were detected from April to October. The first human West Nile virus activity in Arizona was reported in June from a retrospective case with onset in mid April. The first WNv fatality in 2004 occurred in a Maricopa County resident reported on 25 June.

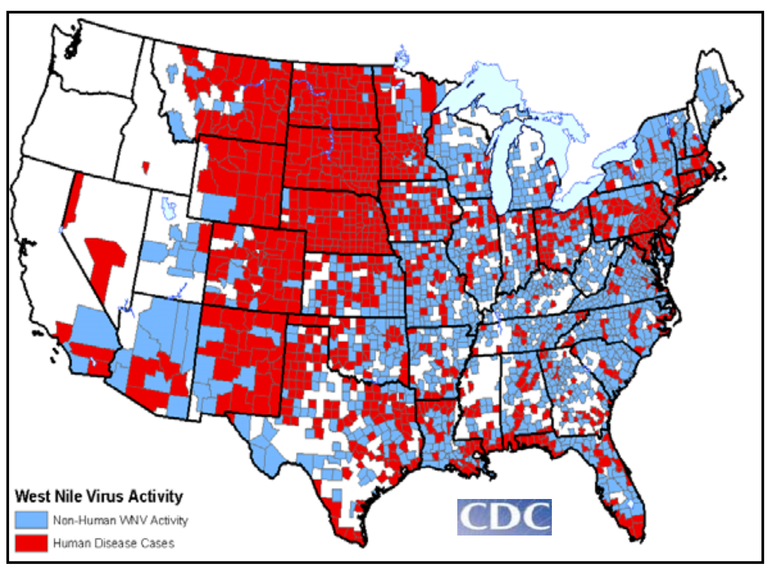


Figure 6. U.S. Counties with human or non-human WNv activity, 2003

i. Areas of New Mexico and Texas had significant WNv activity in 2004. A majority of the human cases in these two states were detected in suburban areas of Albuquerque, Houston, and El Paso. This shift from the 2003 human cases in mostly rural or agricultural areas of the Rocky Mountain States and western Great Plains states to urban centers of the Southwest during 2004 is most likely due to *Cx. quinquefasciatus* supplanting *Cx. tarsalis* as a major vector of WNv in these areas of the country.

j. As the 2004 mosquito season progressed, areas of Utah and Nevada began reporting WNv activity. Mesa County in Western Colorado was the center of WNv activity in the State during 2004. This signified the shift of viral activity from the Colorado Front Range and eastern counties in 2003 over the Rocky Mounties to western slope counties in 2004. Viral activity was also detected in most northern California counties and several areas of Oregon during 2004. Washington, Alaska, and Hawaii remain the only states reporting no human cases of WNv. For 2004 WNv human case numbers see Figure 7.

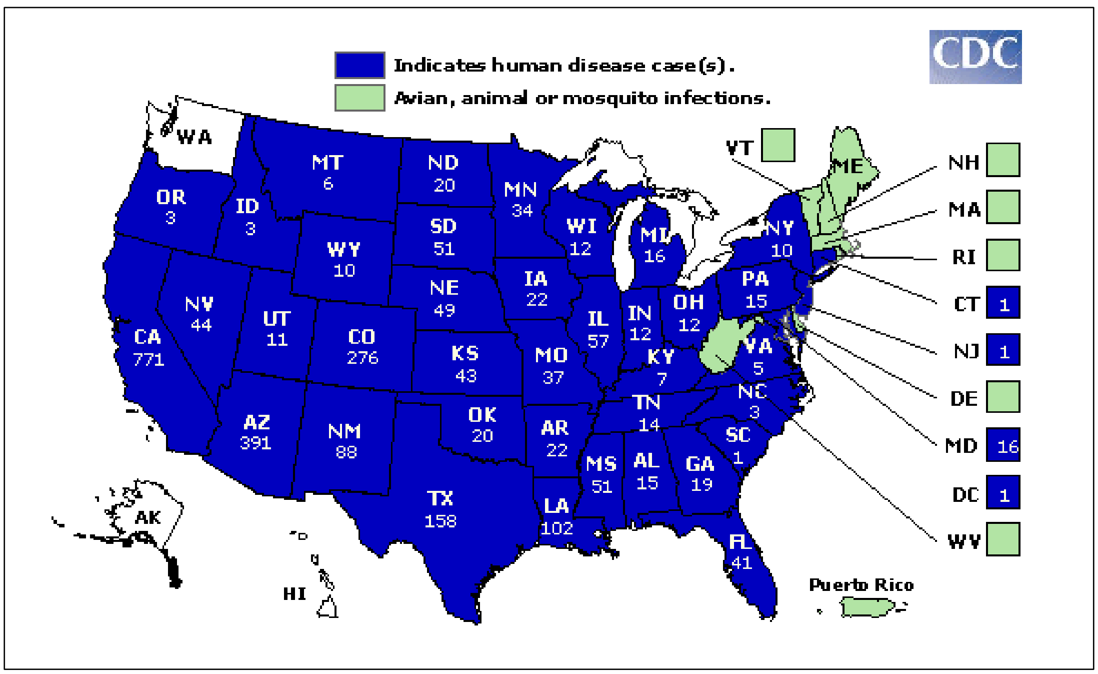
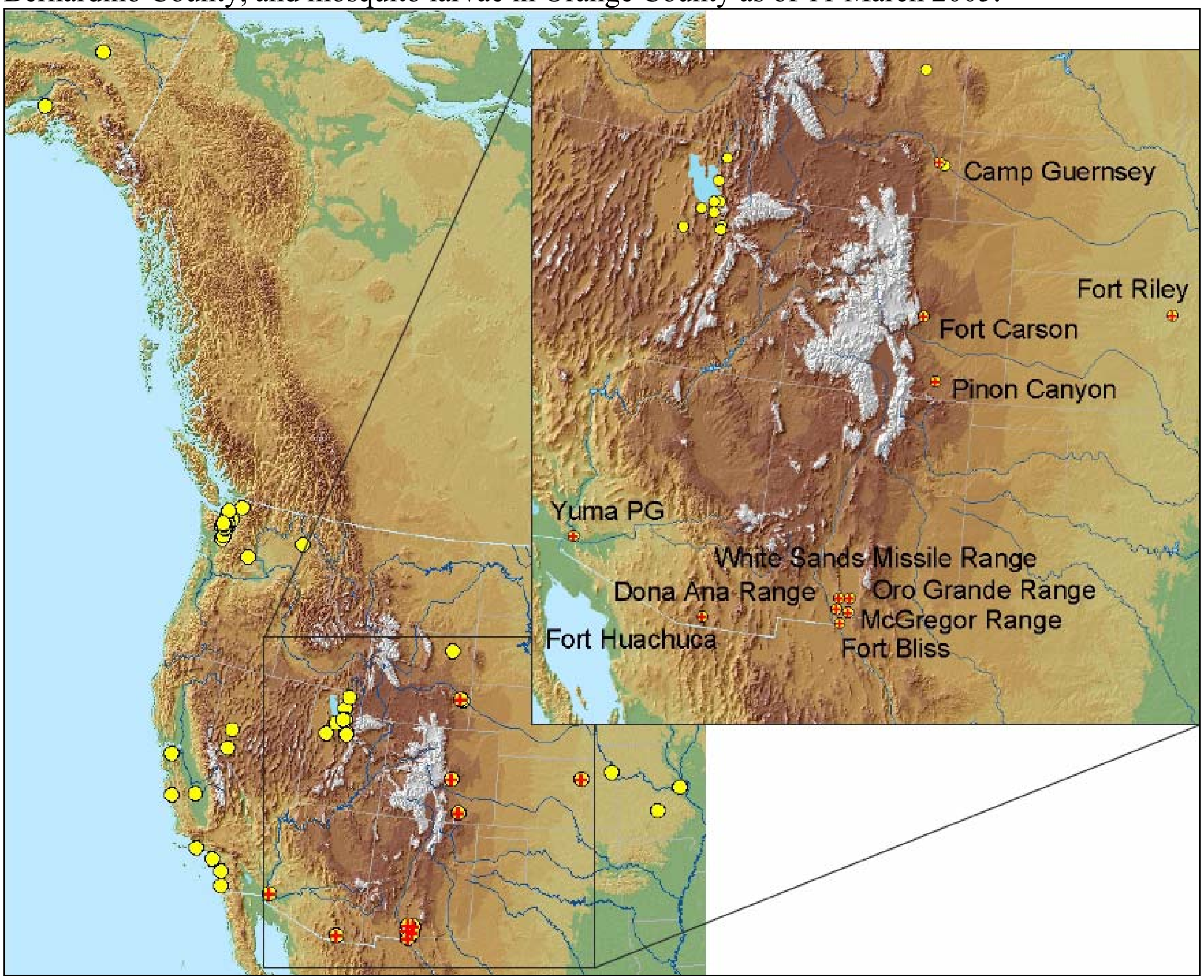


Figure 7. Human WNv cases, 2004

5. FINDINGS AND DISCUSSION. The WNv mosquito surveillance program was initiated to give the medical community and installation Preventive Medicine personnel an early indication of an impending threat of acquiring this disease. Human cases usually follow reports of positive birds or mosquito pools by about one month. Therefore, it is good public health practice to conduct surveillance on animal populations whenever possible to forewarn personnel of a possible medical threat. The 2003 mosquito season was the first year USACHPPM-West tested mosquitoes for WNv and 30 military installations submitted mosquitoes for WNv. During the 2004 mosquito season 51 installations submitted mosquitoes for WNv testing. See Figure 8 for the map locations where mosquitoes were collected and submitted for testing at our laboratory

within the last two years. The map also shows installations where positive mosquitoes were detected in either 2003 or 2004. Three installations shown on the map produced positive mosquitoes in 2003 and not 2004; Fort Riley, KS, Piñon Canyon Maneuver Site, CO and Camp Guernsey, WY. Fort Carson, CO and Yuma Proving Ground, AZ detected positive mosquitoes in both years. Fort Bliss, TX, the four ranges in New Mexico, in addition to Fort Huachuca, AZ detected positive mosquitoes in only 2004. Several new sites initiated surveillance in 2004 mostly in Utah and California due to the increased threat of WNv as this disease began to impact more humans west of the Rocky Mountains. There are several indications that WNv activity will remain centered in California in 2005, and according to Vicki Kramer with the California Department of Health Services, the Sacramento Valley maybe one of the hardest hit areas in the nation. Positive birds have already been detected in two Northern California counties as of February 2005. The virus has also been detected in 17 dead birds in California, a chicken in San Bernardino County, and mosquito larvae in Orange County as of 11 March 2005.



Sites submitting mosquitoes for WNv testing
+ Sites with WNv positive mosquitoes

Figure 8. Locations of military installations in the USACHPPM-West region conducting mosquito surveillance for West Nile virus in 2003 or 2004.

a. The USACHPPM-West laboratory tested 70,111 female mosquitoes for WNv in 2004. Mosquitoes were submitted from 34 Army, Army Reserve Readiness Command, or Army National Guard installations and 17 Navy installations in the USACHPPM-West region. For a list of locations and the number of mosquitoes tested from DoD installations see Enclosure 1.

(1) A total of 4,630 mosquitoes submitted from Navy installations were tested for WNv during the 2004 mosquito season. All mosquitoes tested from 14 Navy installations in the Puget Sound area and three in California were negative for WNv.

(2) Thirty four Army installations in 10 states submitted 65,481 mosquitoes for WNv testing. In 2004, our laboratory confirmed 53 positive pools for WNv from the following installations: Fort Bliss, TX (24); McGregor Range, NM (13); Yuma Proving Ground, AZ (10); Fort Carson, CO (2); Fort Huachuca, AZ (1); Dona Ana Range, NM (1), White Sands Missile Range, NM (1), and Oro Grande Range, NM (1). The 53 positive pools consisted of *Culex tarsalis* (35) and *Culex quinquefasciatus* (18).

6. SELECTED INSTALLATION RESULTS AND DISCUSSION.

a. **Yuma Proving Ground (YPG), Arizona.**

(1) In 2003, adult mosquito surveillance began in May but collections were inconsistent until June. Although mosquitoes can be collected during the winter months at YPG mosquito surveillance was suspended on 14 November 2003 as past history has shown that arborviral activity was not detected in this area of the country after 1 November. Over 5,200 female mosquitoes were collected and tested for WNv. Seventy five percent of these mosquitoes were *Cx. tarsalis*, the major vector of WNv in the area. Three of the 139 pools of this species tested positive for WNv. Positive mosquitoes were collected on 7, 17 and 22 September 2003.

(2) During the 2004 mosquito season over 4,900 *Cx. tarsalis* were collected from 6 April to 26 October. These mosquitoes were processed for WNv testing in 266 pools. Nine positive pools were detected from collections made between 1 June and 10 August. The 1 June collections of *Cx. tarsalis* produced the first positive pool detected at our laboratory in 2004. The first positive mosquito pool at YPG for 2004 was detected three months earlier than the previous year. In addition to the 9 positive *Cx. tarsalis* pools, a single *Cx. quinquefasciatus* positive pool, out of only five pools tested, was detected from a collection made on 3 August.

(3) One of the major reasons additional positive pools of mosquitoes were not detected after 10 August 2004 (typically viral transmission increases in the late summer and early fall) was because of the extensive adult mosquito control measures implemented in mid July. The following graph in Figure 9 shows the last two years of *Cx. tarsalis* collections at YPG. Typically, these collections show a bimodal population curve. In the spring time, as over wintering mosquitoes become more active, trap counts are relatively high. The high daytime summer temperatures begin to drive populations down until late summer when populations begin to increase again. During past mosquito seasons, adult controls at YPG consisted of barrier treatments and early morning spraying, usually twice a week. The 2003 graph shows only the

second population peak as collections did not begin soon enough that year. It also shows that early morning controls did not suppress populations of *Cx. tarsalis* in late September and early October. In mid July 2004, after a number of positive pools were detected, the timing of controls were changed to occur at night because *Cx. tarsalis* is more active at dusk and into the late evening rather than in the early morning or at dawn. With the change in the timing and an increase of the number of control events per week more adult mosquitoes were killed and the second bimodal peak did not occur.

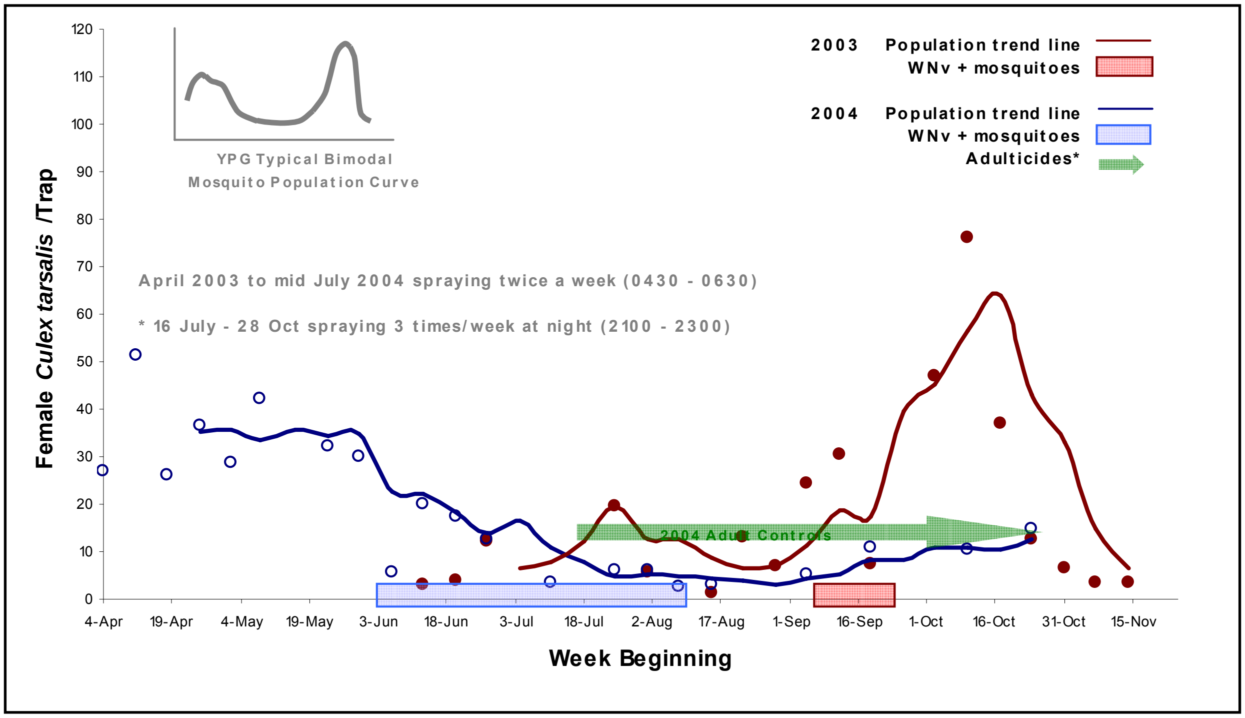


Figure 9. YPG *Culex tarsalis* population trends based on EVS trap collections in 2003 and 2004.

b. **Fort Riley, Kansas.**

(1) Within the last three years, human WNv cases occurred in over 150 people and caused at least 9 deaths in Kansas. In 2004, 43 people contracted WNv, with onset of the first human case during the second week of June. In previous years the onset of the first human case did not occur until 12 August in 2002 and 20 July in 2003. Even though the number of human cases decreased from a yearly high in 2003, human cases were reported earlier each year since the virus first caused human illness in the state in 2002.

(2) In 2002 and 2003, collection data from Fort Riley revealed that WNv activity was not detected in mosquitoes until populations of *Culex sp*. began to increase considerably, usually by mid August. It appears that once the numbers of female *Culex* mosquitoes reach at least 10 individuals per trap/night the probability of detecting WNv in mosquito pools increases. This threshold number was attained about two to three weeks prior to the first detection of WNv

positive mosquitoes at Fort Riley. In 2002 and 2003, positive mosquito pools were detected during the first week of September.

(3) Fort Riley is another installation where mosquito controls appeared to help reduce the risk of WNv transmission. Mosquito controls at Fort Riley are based on treating breeding sites early in the season to control larval mosquitoes and then spraying for adults when mosquito trap indices reach threshold numbers. These controls usually continue into September. Prior to 2004 adult controls were based mostly on New Jersey light trap collections of *Aedes vexans*. This species of mosquito usually emerges earlier in the season and is considered more of a nuisance biter than a vector of disease. In 2004, controls were shifted somewhat to concentrate more on areas that produced *Culex* mosquitoes and were based more on *Culex* collections from CDC light traps or gravid traps. During, 2004 *Culex* populations rose much earlier than the pervious two years (see Figure 10) but it appears that adult controls during the end of July helped to drive trap counts down just when the threat of WNv typically increases. By mid August, *Culex* trap counts were below 10 female mosquitoes per trap and remained so for the rest of the season. One reason for this was because controls remained in place through September. No positive mosquitoes were detected at Fort Riley even though positive mosquito pools were detected in the county.

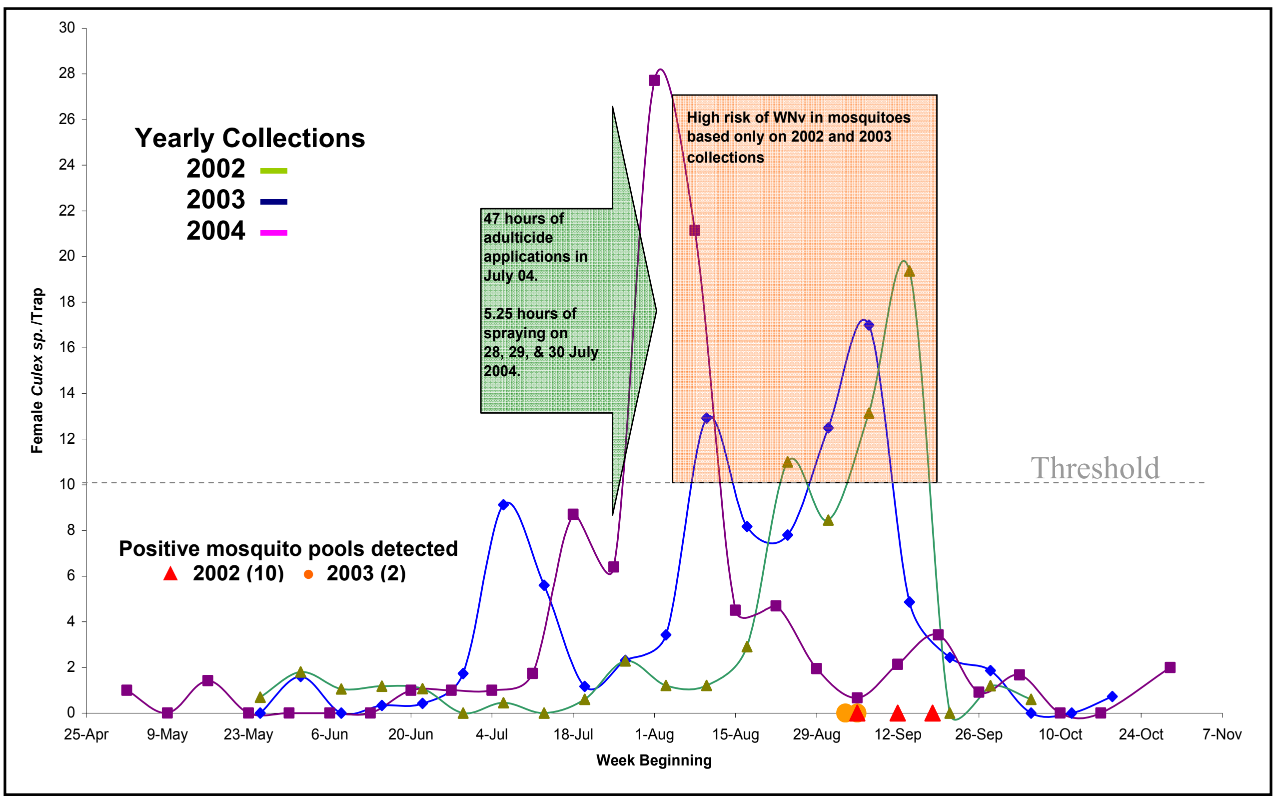


Figure 10. Fort Riley, KS 2002, 2003, and 2004 *Culex sp.* collections.

c. **Fort Carson, Colorado.**

(1) In 2004, Colorado experienced a vast reduction in the number of WNv human cases from those reported during the previous year. However, Mesa County in western Colorado had one of the highest per capita incidence rate in the country. For a synopsis of WNv activity dating back to 2002 in Colorado and Fort Carson see Reference 1e.

(2) Fort Carson Preventive Medicine Service personnel conducted mosquito surveillance in 2004 from 21 May to 7 September. New Jersey light traps (NJLT) and Mosquito Magnets ™ were used to collect mosquitoes on a consistent basis, usually two times a week. Increased surveillance during 2004 produced over 8 times the number of mosquitoes (5,746) tested for WNv at Fort Carson than the previous year (691). In 2003, 438 *Cx. tarsalis* mosquitoes were tested for WNv producing 8 positive pools between 18 July and 11 August. In 2004, 765 *Cx. tarsalis* were tested producing only 2 positive pools, one each on 11 August and 7 September.

d. **McGregor Range, New Mexico.**

(1) In 2004, 14,968 *Cx. tarsalis* were tested from the mosquitoes collected at the sewage retention pond, see Figure 11. This was only a portion of the mosquitoes collected from this site. Single light trap collections numbered over 4,000 female mosquitoes per night on numerous occasions prior to the implementation of effective control measures.

Figure 11. McGregor Range, NM Sewage Retention Pond

(2) This isolated training area produced fifteen positive *Cx. tarsalis* pools between 6 July and 15 September. One soldier, training at McGregor Range during the month of August, was confirmed positive for WNv on 24 August 2004. This confirmed case, in addition to the mosquito collection data from McGregor Range, supports the premise that large populations of vector competent mosquitoes maybe a precursor to impending human involvement with WNv transmission in endemic areas of the country.

e. **White Sands Missile Range, New Mexico.**

(1) Minimal adult mosquito surveillance (28 trap nights) produced 798 female *Cx. tarsalis* and one positive pool from mosquitoes collected on 27 August 2004. Most of these mosquitoes were collected at the storm water and sewage retention pond at Davies Tank pictured in Figure 12.

Figure 12. White Sands Missile Range, NM Extensive flooding at Davies Tank
OPSEC Reviewed 24 September 2004 by Gene Frrsythe SFIM-SW-WS-EC

In addition, over 11,000 *Culex salinarius* were collected from this same site between 10 June and 19 October. This species may serve as an important bridge vector of WNv.

(2) Davies Tank serves as a congregation point for numerous migratory birds. Consequently, environmental concerns are paramount regarding mosquito controls in this area.

f. **Fort Bliss, Texas.**

(1) During the last three years the CDC has reported almost 1,100 human cases of WNv with 58 deaths in Texas. El Paso County, Texas reported one of the highest numbers of human cases per county than all but eight counties nationwide. One reason for this is the likelihood that a fifteen year high amount of rainfall dramatically favored an increase in the populations of mosquitoes that transmit WNv. The first indication of WNv activity in the county during 2004 was a positive *Cx. tarsalis* pool collected on 6 July at Fort Bliss.

(2) Extensive mosquito surveillance and WNv preventive measures were implemented at Fort Bliss between May and November 2004. Numerous breeding sites were identified early in the season and large numbers of adult mosquitoes were collected prior to the end of May. Control measures however, were not initiated until after the detection of the first positive mosquito pool. Three to ten traps were operated on a weekly basis during most of the mosquito season. Mosquito collections produced large numbers of *Cx. tarsalis* (3,700) and *Cx. quinquefasciatus* (4,026) that were tested for WNv; 9 and 15 positive pools were detected, respectively. The following graph (Figure 13) illustrates the number of these two mosquito species trapped per night averaged over a given week.

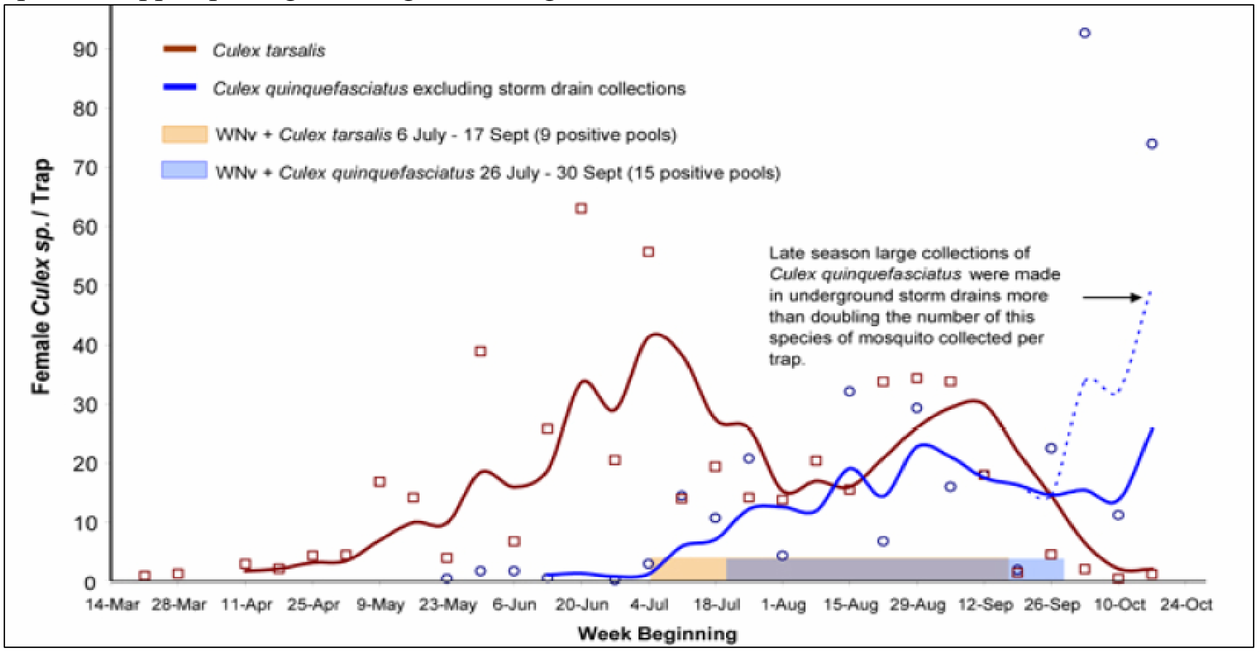


Figure 13. Fort Bliss, Texas, *Culex tarsalis* and *Culex quinquefasciatus* population trends based on 2004 Gravid and Light Trap Collections.

(3) Controls may have had some effect on *Cx. tarsalis* numbers in late July and for a few weeks in August. Trap counts were lower at specific sites, such as the golf course and Child Development Center, accounting for an overall reduction in the collection numbers of this species of mosquito. Because of sporadic controls, light trap counts were on the rise by the middle of August and did not decrease until mid September. This decrease was most likely due to cooler evening temperatures as these mosquitoes became less active in seeking a blood meal prior to their winter diapause. Controls can show some effectiveness but once mosquito populations reach a high level a regimented control program is necessary over wider areas and not just at specific sites. Positive *Cx. tarsalis* pools were detected from early July to mid September.

(4) Controls did not seem to have an effect on populations of *Cx. quinquefasciatus*. Fluctuations in trap counts seem more tied to high amounts of rainfall in July and August. Increased rainfall attributed to decreases in this population of mosquitoes as breeding sites were essentially cleansed by flood water. As the monsoon rains subsided periodically, flooded areas dried up and mosquito counts would rise. The first positive pool was detected from collections made on 26 July and positive pools were detected almost weekly until the last positive pool of the year was detected on 30 September 2004.

7. WEST NILE VIRUS EDUCATION PROGRAM. Education is one of the most important aspects of preventive medicine. An informed public will have a significantly reduced risk of acquiring disease. The potential risk for acquiring a mosquito-borne disease can be minimized by encouraging public participation to reduce man-made collections of standing water (mosquito breeding sites) and to implement personal protection techniques. The following objectives are an instrumental part of any mosquito-borne disease education program.

a. Improve public understanding of the vectors and reservoirs of vector-borne diseases to include the role of mosquitoes, birds, and mammals in disease transmission. In-service training on WNv should include discussions on other vector-borne diseases.

b. Increase awareness among the public and health care professionals regarding the potential risk of infection with various vector-borne diseases. This should include an awareness of local transmission verses potential transmission when traveling to other areas. Improve the knowledge among health care providers of the signs and symptoms of mosquito-borne encephalitides. Encourage health care providers to promptly report cases of human vector-borne diseases through state and military channels.

c. Promote public cooperation in reducing mosquito-breeding sites. Eliminate water-filled containers such as buckets, plant saucers, cans, and old tires. Maintain or drain swimming pools, tubs, water troughs, and birdbaths. In addition, keep water in landscape ponds from stagnating and stock with natural predators (e.g., fish) of mosquito larvae.

d. Encourage personal protection to reduce mosquito bites, such as wearing appropriate clothing, using insect repellents, and minimizing outdoor activities between dusk and dawn when mosquitoes are generally more active. During the day, mosquitoes may be active in shaded areas or woodlands, and protective measures should be implemented under these circumstances.

8. CONCLUSIONS.

a. Biweekly mosquito collections should commence in May to monitor vector mosquito population changes and determine when the risk of acquiring WNv has increased.

(1) *Culex tarsalis* is the main vector of WNv west of the Mississippi River, particularly in rural areas where irrigation is prevalent.

(2) *Culex quinquefasciatus* is an important vector of WNv in suburban areas of the southwestern United States as exhibited in California, Arizona, and Texas during the 2004 season.

b. The timely implementation of mosquito controls will help to reduce the threat of WNv. Larval and adult mosquito surveillance activities require routine or expanded efforts based on current threat levels of WNv. Larval surveillance is lacking at many installations in the USACHPPM-West region of responsibility.

(1) Larval surveillance and the identification of breeding sites is an integral part of a mosquito surveillance program and should be initiated as soon as possible in the spring. Larval controls should begin based on larval surveillance prior to the emergence of adults.

(2) Adult controls should be initiated only after larval control methods have proven to be ineffective and threshold counts of female mosquitoes exceeded an established threshold.

c. Mosquitoes associated with storm drains may be an integral part of the WNv transmission cycle and virus carryover into the following year.

d. Adult mosquitoes testing positive for WNv in many areas prior to either birds or horses. This adds credence to the premise that mosquito surveillance is probably the best way to determine when WNv activity is in an area. In addition, the detection of positive mosquitoes is the best indicator of when public health officials and pest control operators need to activate plans to further reduce the risk.

e. Education, prevention, and control measures need to be developed and practiced to meet potential or actual WNv threat levels. These methods should be renewed yearly.

f. An educated and involved public will help to reduce WNv transmission.

9. Questions or comments on the contents of this report or general questions concerning WNv should be directed to Mr. Irwin at DSN 347-0083, COM (253) 966-0083 or electronic mail at william.irwin@nw.amedd.army.mil. USACHPPM-West is available to provide consultation and recommendations regarding mosquito surveillance and control measures to help reduce the

medical threat of WNv. For other assistance provided by USACHPPM-West see our web page at http://chppm-www.apgea.army.mil/services/westdir.htm or Enclosure 2.

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LEON L. ROBERT, JR.
LTC (P), MS
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CDR, Tooele Army Depot, ATTN: MCXE-PMC-OHC-T (CPT Staker)
CDR, Deseret Chemical Depot, ATTN: AMSSB-ODC-RM (R. Trujillo)
CDR, Yakima Training Center, ATTN: ENRD (C. Leingang)
CDR, Yuma Proving Ground, ATTN: PVNTMED SVC (SGT Cortez)
CDR, White Sands Missile Range, ATTN: WS-ES-ES (C. Rodden)
CDR, White Sands Missile Range, ATTN: HCHM-MHC-CO (COL Campbell)
CDR, USARC, ATTN: AFRC-MD
CDR, 200th Medical Detachment Fort Douglas, UT, ATTN: (MAJ Messmer)
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CDR, USACHPPM, ATTN: MCHB-AN-ES
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ACTIVITIES SUBMITTING MOSQUITOES, 2004

	Location	State	Number of Mosquitoes Tested
ARMY	Browning USA Reserve Center	UT	219
	Camp Guernsey (National Guard)	WY	414
	Camp Parks (Reserve)	CA	247
	Camp Williams (National Guard)	UT	93
	Dona Ana Range	NM	3918
	Dugway Proving Ground	UT	19
	Fort Bliss	TX	8457
	Fort Carson	CO	5746
	Fort Douglas (Reserve)	UT	19
	Fort Huachuca	AZ	476
	Fort Hunter Liggett	CA	20
	Fort Laramie (National Park)	WY	436
	Fort Lawton (Reserve)	WA	11
	Fort Leavenworth	KS	3546
	Fort Leonard Wood	MO	219
	Fort Lewis	WA	1949
	Fort Riley	KS	6593
	Gillette National Guard Armory	WY	36
	Hawthorne Army Depot	NV	161
	Jenkins USA Reserve Center	UT	87
	Los Alamitos JFTB	CA	98
	McGregor Range	NM	15350
	Meyer Range	NM	50
	Oro Grande Range	NM	2418
	Pinon Canyon Maneuver Site	CO	483
	Post Falls National Guard Armory	ID	12
	Rex Hall USA Reserve Center	UT	3
	Tooele Army Depot	UT	71
	Uchida USA Reserve Center	UT	44
	Utah County South NG Armory	UT	83
	Weldon Springs (Reserve)	MO	72
	White Sands Missile Range	NM	7760
	Yakima Training Center	WA	415
	Yuma Proving Ground	AZ	5756
NAVY	Bainbridge Island	WA	170
	Camp McKean	WA	4
	Camp Pendleton	CA	283
	Camp Wesley Harris	WA	82
	Everett Naval Air Station	WA	6
	Indian Island Naval Weapons Station	WA	294
	Jim Creek Naval Radio Station	WA	53
	Kingston Navel Housing	WA	17
	Lemoore Naval Air Station	CA	518
	Naval Base Kitsap	WA	108
	Naval Base Kitsap-Bremerton	WA	74
	Naval Fuel Depot Manchester	WA	99
	Naval Hospital Bremerton	WA	14
	Point Mugu Naval Base	CA	2274
	Puget Sound Naval Shipyard	WA	244
	Submarine Base Bangor	WA	389
	Zelatched Point	WA	1

TECHNICAL ASSISTANCE

Technical advice and/or consultation, to include on-site assistance, may be obtained by telephoning our USACHPPM-West at DSN 347-0008 or (253) 966-0008. USACHPPM-West provides the following services:

1. Entomological laboratory support
2. Pesticide equipment calibration
3. Pest management document review
4. Hazardous waste management
5. Industrial hygiene management
6. Worksite hazards management
7. Sanitation and hygiene
8. Wastewater management
9. Water supply management
10. Field preventive medicine management
11. Deployment preventive medicine

For assistance in any of the above listed programs, please call:

Entomological Sciences Division - DSN 347-0073
Pest management surveys and consultations; pest identification; hantavirus and Lyme disease surveys; pesticide resistance evaluations; genetic testing for vector-borne diseases; document/ design reviews.

Environmental Health and Engineering Division - DSN 347-0069
Field sanitation and hygiene; potable, recreational, and wastewater quality; hazardous waste and regulated waste management; document/design reviews; regulatory compliance assessments; comprehensive environmental sampling.

Industrial Hygiene Division - DSN 347-0052
Industrial hygiene; hazard communication; protective equipment programs; document/design reviews.

Field Preventive Medicine Division - DSN 347-0060
Review TO&E operation plans and SOPs; establish/review TO&E medical intelligence capabilities; provide guidance/develop TO&E Preventive Medicine programs; evaluate TO&E Preventive Medicine training programs; provide mobilization assistance.

During non-duty hours, calls will be recorded by an answering machine and returned the next day. Many additional environmental services are available from our parent organization, the U.S. Army Center for Health Promotion and Preventive Medicine, and are described in USACHPPM Pamphlet 40-2, Directory of Services (published annually). We will gladly coordinate any additional services you request and that we cannot provide with our parent organization